91-01934/

Common Root Rot, Seedling [illegible] and Prematurity Blight of [illegible]

FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Common root rot, seedling blight and prematurity blight of cereals are caused by the same species of soil-inhibiting fungi (*Cochliobolus sativus* and *Fusarium* spp.). Affected crops include wheat, barley, oats and many grasses. The root rot causing fungi are widespread in prairie soils and virtually all cereal crops will show some degree of symptoms. In Saskatchewan, average yield losses in wheat are estimated to be 7% annually. Losses are due to a reduction in the number of heads, reduced seed size and fewer seeds per head. Yield losses in barley on the prairies are estimated at 10% annually. Oat crops are less severely affected.

Symptoms

1. *Seedling Blight:* Seedling blight occurs when seedlings are attacked before or shortly after emergence. There may be brown spots on the coleoptile, roots and culms. Seedlings may be killed or stunted by early infections. Damping-off often occurs when the disease is seed-borne.

2. *Common Root Rot:* Symptoms of common root rot include brown spots or discoloration on the roots, subcrown internode, lower leaf sheaths and crown. Affected plants tend to be scattered over a field, and they may be slightly stunted. Root rot may be tolerated by the plant with no above ground symptoms, as long as sufficient new roots are generated.

3. *Prematurity Blight:* Prematurity blight is a severe manifestation of common root rot, triggered by stress. The critical period for stress (such as drought) is between the flag leaf and flowering stages. Drought in combination with high temperatures is the most important predisposing factor, but nutritional stress or insect damage have also been implicated.

   Prematurity blight appears as prematurely ripened, stunted plants scattered in a field. These white, bleached plants contrast sharply with healthy green plants. A brown discoloration may extend up the lower stem, and plants usually break off easily near soil level when pulled. Seed may be shrivelled or heads may be sterile.

Life Cycle

Most infections are initiated by soil-borne spores, however, infection can also be carried on or in the seed. New spores are produced on infected plants or on crop debris. Spores are spread by wind, water, cultivation and infected seed, and can remain viable in the soil for several years.

Root rot occurs in both wet and dry soil, however, the disease tends to be worse under dry conditions.

Control

1. Avoid deep seeding, as this increases disease severity. Shallow seeding has been shown to significantly reduce root rot.
2. Fungicide seed treatment will reduce seedling blight, but will not control root rot in post-seedling plants.
3. Turning under straw and stubble, or incorporation of straw at seeding time slightly reduces infection in the subsequent crop.
4. Rotations that include several years of non-host crops (eg. canola, flax, legumes) reduce spore populations in the soil and thus tend to lessen disease.
5. Maintaining adequate and balanced soil fertility helps to decrease the severity of prematurity blight and supports vigorous root and shoot growth.
6. While no varieties have complete resistance to root rot, there are varieties with intermediate to good resistance. Use of varieties rated as susceptible should be avoided, if possible, on fields with a history of severe root rot.

Varieties with Good Resistance

Common Wheat: Bluesky, Glenlea, Laura, Roblin, Wildcat

Durum Wheat: Sceptre, Wakooma.

Barley: Abee, Argyle, Bonanza, Condor, Duece, Duke (VG), Harrington, Heartland, Klages, Samson, Tupper, Virden (VG), Winchester.

Note: VG = very good

Varieties with Fair Resistance

Common Wheat: Benito, Biggar, Columbus, Canuck, Conway, HY355, Katepwa, Kenyon, Lancer, Neepawa, Oslo, Park, Selkirk, Sinton.

Durum Wheat: Arcola, Coulter, Kyle, Medora, Wascana.

Soft White Wheat: Fielder, Owens.

Barley: Betzes, Conquest, Ellice, Klondike, Leduc, Scout.

Varieties with Poor Resistance

Common Wheat: Leader.

Winter Wheat: Norstar, Norwin.

Barley: Centennial, Diamond, Galt, Jackson, Johnston, Melvin, Noble, Otal.

Plant Pathologist
January, 1990

5M 01/90 ISSN 0840-9447